SIEMENS

Single Operational Amplifiers

TAA 762
TAA 765

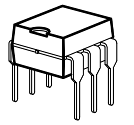
Bipolar IC

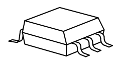
Features

- Wide common-mode range
- Large supply voltage range
- Large control range
- Wide temperature range (TAA 762)
- High output frequency compensation
- Open collector output

Applications

- Amplifier
- Comparator
- Level converter
- Driver


P-DIP-6-1

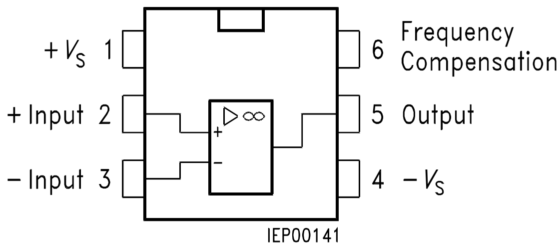

P-DSO-6-1

Type	Ordering Code	Package
TAA 762 A	Q67000-A2271	P-DIP-6-1
TAA 762 G	Q67000-A2273	P-DSO-6-1 (SMD)
TAA 765 A	Q67000-A524	P-DIP-6-1
TAA 765 G	Q67000-A599-G403	P-DSO-6-1 (SMD)

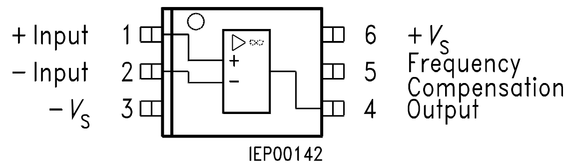
Particularly economic and versatile op amps. Owing to their excellent performance qualities they are well suited for a wide scope of applications, as in control engineering, automotive electronics, AF circuits, analog computers, etc.

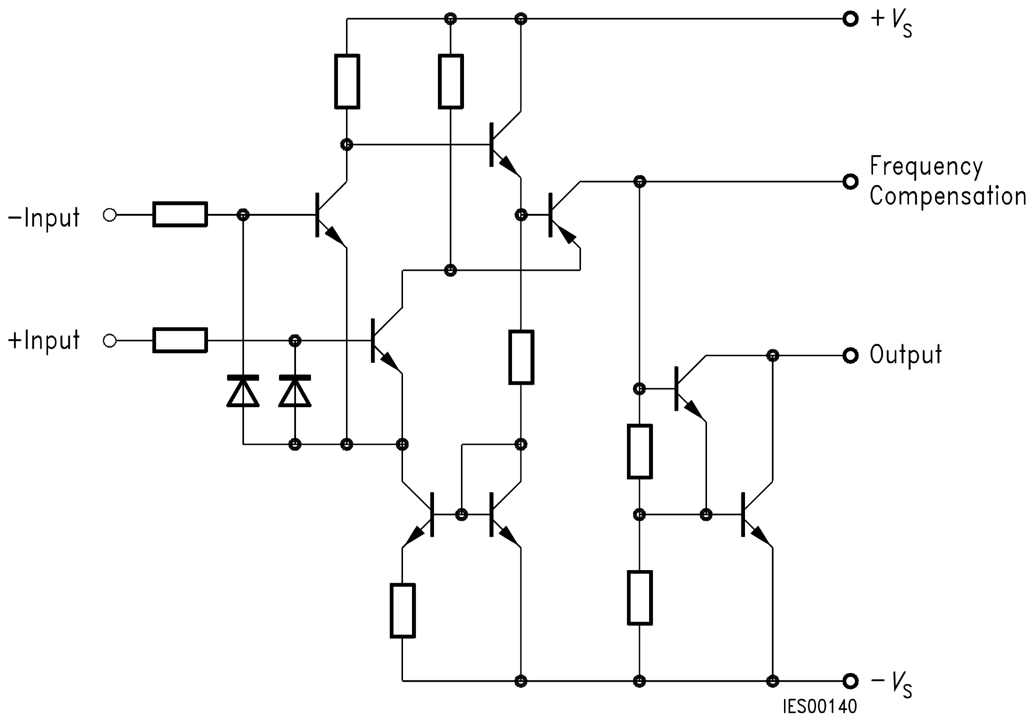
Pin Configurations
(top view)

**TAA 762 A
TAA 765 A**

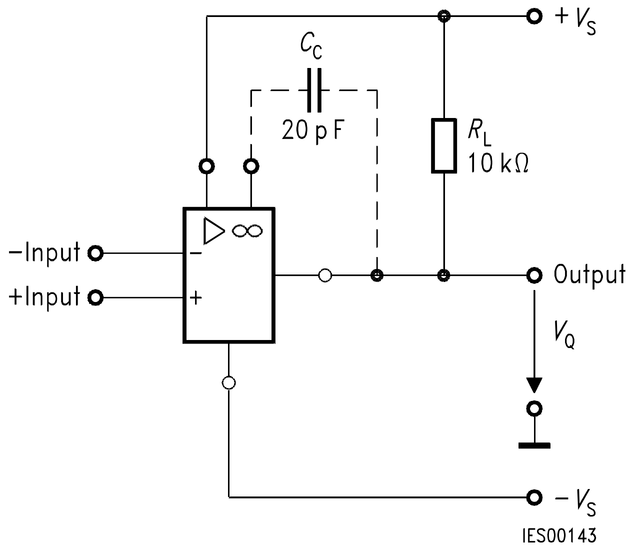


**TAA 762 G
TAA 765 G**





Circuit Diagram



C_C = output frequency compensation;
R_L = load resistance (collector resistance)

Connection Diagram

Absolute Maximum Ratings (TAA 762)

Parameter		Symbol	Limit Values	Unit
Supply voltage		V_S	± 18	V
Output current		I_Q	70	mA
Differential input voltage		V_{ID}	± V_S	V
Junction temperature Storage temperature range		T_j T_{stg}	150 – 55 to 125	°C °C
Thermal resistance system - air	 TAA 762 A TAA 762 G	 $R_{th\ SA}$ $R_{th\ SA}$	 115 200	 K/W K/W

Operating Range (TAA 762)

Parameter	Symbol	Limit Values	Unit
Supply voltage	V_S	± 1.5 to ± 18	V
Ambient temperature	T_A	– 55 to 125	°C

Characteristics (TAA 762)
V_S = ± 5 V to ± 15 V; R_L = 2 kΩ,
unless otherwise specified

Parameter	Symbol	Limit Values T_A = 25 °C			Limit Values T_A = – 55 to 125 °C		Unit
		min.	typ.	max.	min.	max.	
Open-loop supply current consumption	I_S		1.5	2.5		2.5	mA
Input offset voltage R_G = 50 Ω	V_{IO}	– 4		4	– 6	6	mV
Input offset current	I_{IO}	– 100	± 50	100	– 300	300	nA
Input current	I_I		0.3	0.7		1.0	µA
Control range							
V_S = ± 15 V	$V_{Q\,pp}$	14.9		– 14	14.8	– 14	V
R_L = 620 Ω, V_S = ± 15 V	$V_{Q\,pp}$	14.9		– 12.5	14.8	– 12	V
V_S = ± 15 V, f = 100 kHz	$V_{Q\,pp}$		± 10				V
Input impedance f = 1 kHz	Z_I		200				kΩ
Open-loop voltage gain							
f = 1 kHz	G_{V0}	85	87		80		dB
R_L = 10 kΩ, f = 1 kHz	G_{V0}		92				dB
f = 1 MHz	G_{V0}		43				dB
Output reverse current	I_{QR}			1		5	µA
Common-mode input voltage range	V_{IC}	$-V_S + 2$		$V_S - 2$	$-V_S + 3$	$V_S - 3$	V
Common-mode rejection	k_{CMR}	80	85		75		dB
Supply voltage rejection G_V = 100	k_{SVR}		25	200		200	µV/V

Characteristics (TAA 762) (cont'd)
$V_S = \pm 5$ V to ± 15 V; $R_L = 2$ kΩ,
unless otherwise specified

Parameter	Symbol	Limit Values $T_A = 25$ °C			Limit Values $T_A = -55$ to 125 °C		Unit
		min.	typ.	max.	min.	max.	
Temperature coefficient of V_{IO} $R_G = 50\ \Omega$	α_{VIO}		6	25		25	µV/K
Temperature coefficient of I_{IO} $R_G = 50\ \Omega$	α_{IIO}		0.3	1.5		1.5	nA/K
Slew rate of V_Q for non-inverting operation (**test circuit 1**)	SR		9				V/µs
Slew rate of V_Q for inverting operation (**test circuit 2**)	SR		18				V/µs
Noise voltage (in acc. with DIN 45 405; referred to input; $R_S = 2.5$ kΩ)	V_n		3				µV

Characteristics (TAA 762)
$V_S = \pm 2$ V; $R_L = 2$ kΩ

Parameter	Symbol	min.	typ.	max.	min.	max.	Unit
Input offset voltage $R_G = 50\ \Omega$	V_{IO}	– 4		4	– 6	6	mV
Input offset current	I_{IO}	– 70		70	– 200	200	nA
Input current	I_I		0.2	0.5		0.8	µA
Open-loop voltage gain $f = 1$ kHz	G_{V0}	80			75		dB

Absolute Maximum Ratings (TAA 765)

Parameter		Symbol	Limit Values	Unit
Supply voltage		V_S	± 18	V
Output current		I_Q	70	mA
Differential input voltage		V_{ID}	± V_S	V
Junction temperature Storage temperature range		T_j T_{stg}	150 – 55 to 125	°C °C
Thermal resistance system - air	 TAA 765 A TAA 765 G	 $R_{th\ SA}$ $R_{th\ SA}$	 115 200	 K/W K/W

Operating Range (TAA 765)

	Symbol	Limit Values	Unit
Supply voltage	V_S	± 1.5 to ± 18	V
Ambient temperature	T_A	– 25 to 85	°C

Characteristics (TAA 765)
$V_S = \pm 5$ V to ± 15 V; $R_L = 2$ kΩ, unless otherwise specified

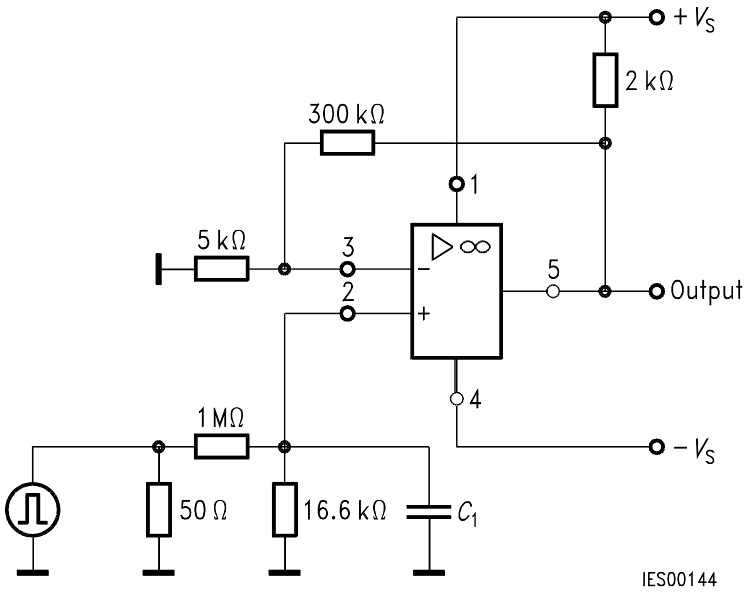
Parameter	Symbol	Limit Values $T_A = 25$ °C			Limit Values $T_A = -25$ to 85 °C		Unit
		min.	typ.	max.	min.	max.	
Open-loop supply current consumption	I_S		1.5	2.5		2.5	mA
Input offset voltage $R_G = 50$ Ω	V_{IO}	– 5.5		5.5	– 7	7	mV
Input offset current Input current	I_{IO} I_I	– 200	± 80 0.5	200 0.8	– 300	300 1.0	nA µA
Control range $V_S = \pm 15$ V $R_L = 620$ Ω, $V_S = \pm 15$ V $V_S = \pm 15$ V, $f = 100$ kHz	 $V_{Q\,pp}$ $V_{Q\,pp}$ $V_{Q\,pp}$	 14.9 14.9 	 ± 10	 – 14 – 12.5 	 14.8 14.8 	 – 14 – 12 	 V V V
Input impedance $f = 1$ kHz	Z_I		200				kΩ
Open-loop voltage gain $f = 1$ kHz $R_L = 10$ kΩ, $f = 1$ kHz $f = 1$ MHz	 G_{V0} G_{V0} G_{V0}	 80 	 85 90 43		 80 		 dB dB dB
Output reverse current	I_{QR}			10		20	µA
Common-mode input voltage range	V_{IC}	$-V_S + 2$		$V_S - 2$	$-V_S + 3$	$V_S - 3$	V
Common-mode rejection	k_{CMR}	75	83		75		dB
Supply voltage rejection $G_V = 100$	k_{SVR}		25	200		200	µV/V

Characteristics (TAA 765) (cont'd)
$V_S = \pm 5$ V to ± 15 V; $R_L = 2$ kΩ, unless otherwise specified

Parameter	Symbol	Limit Values $T_A = 25$ °C			Limit Values $T_A = -25$ to 85 °C		Unit
		min.	typ.	max.	min.	max.	
Temperature coefficient of V_{IO} $R_G = 50$ Ω	α_{VIO}		6	25		25	µV/K
Temperature coefficient of I_{IO} $R_G = 50$ Ω	α_{VIO}		0.3	1.5		1.5	nA/K
Slew rate of V_Q for non-inverting operation (**test circuit 1**)	SR		9				V/µs
Slew rate of V_Q for inverting operation (**test circuit 2**)	SR		18				V/µs
Noise voltage (in acc. with DIN 45 405; referred to input; $R_S = 2.5$ kΩ)	V_n		3				µV

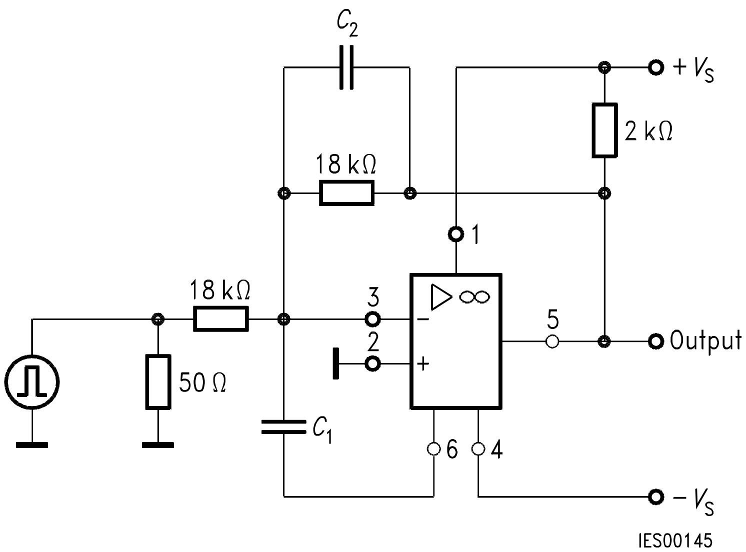
Characteristics (TAA 765)
$V_S = \pm 2$ V; $R_L = 2$ kΩ

Parameter	Symbol	min.	typ.	max.	min.	max.	Unit
Input offset voltage $R_G = 30$ Ω	V_{IO}	– 6		6	– 7.5	7.5	mV
Input offset current	I_{IO}	– 150		150	– 200	200	nA
Input current	I_I		0.2	0.6		0.8	µA
Open-loop voltage gain $f = 1$ kHz	G_{V0}	75			75		dB



C_1 for min. overshoot (approx. 22 pF)

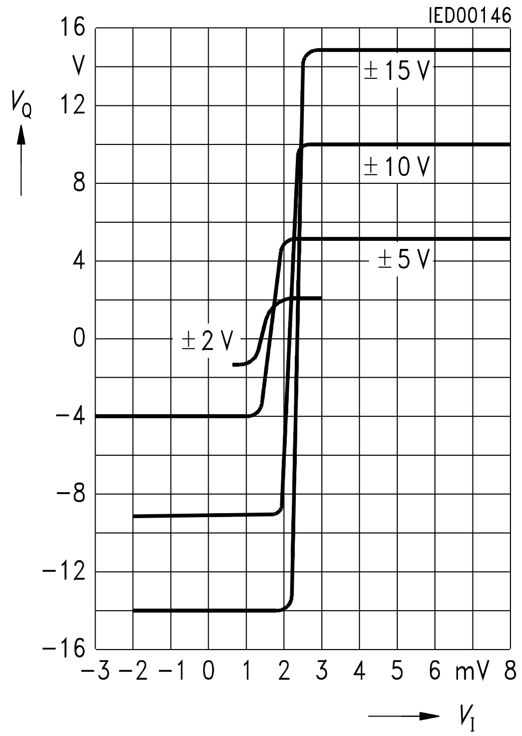
Test Circuit 1 for Slew Rate (non-inverting operation)



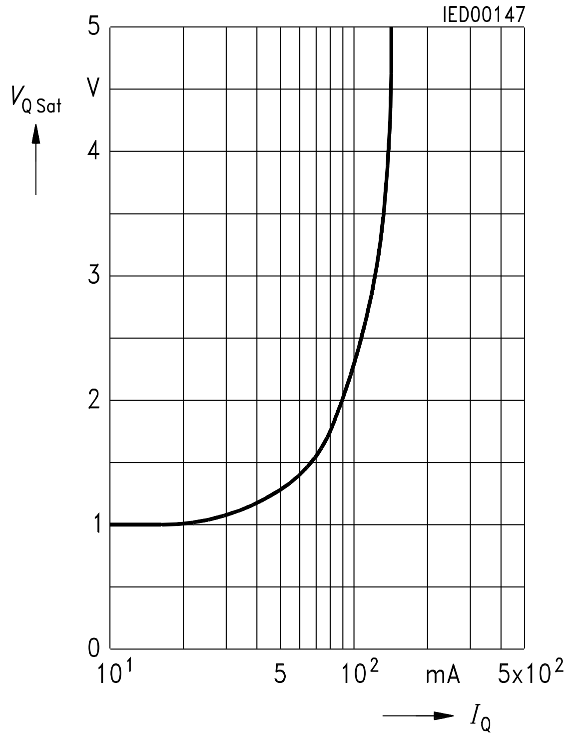
C_2 causes a frequency-dependent compensation to reduce rise times (approx. 390 pF)
C_1 for min. overshoot (approx. 3.9 pF)

Test Circuit 2 for Slew Rate (inverting operation)

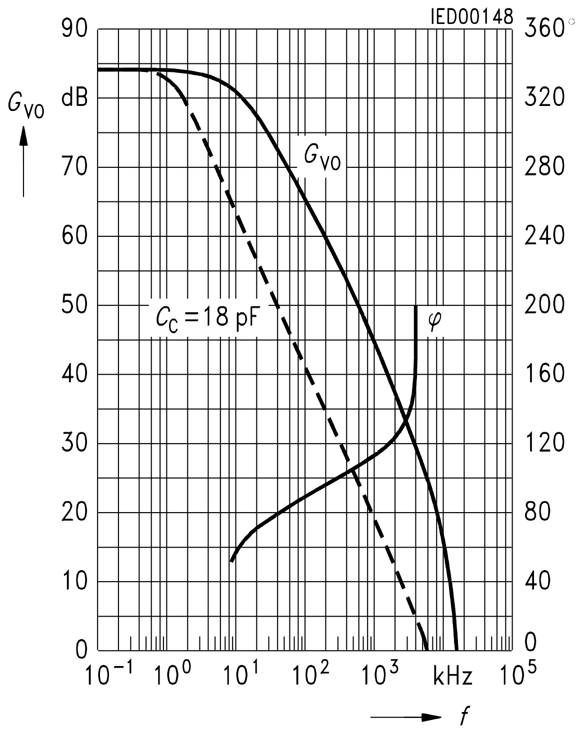
Transfer Characteristic
Output Voltage versus Input Voltage
V_S = parameter, R_L = 2 kΩ



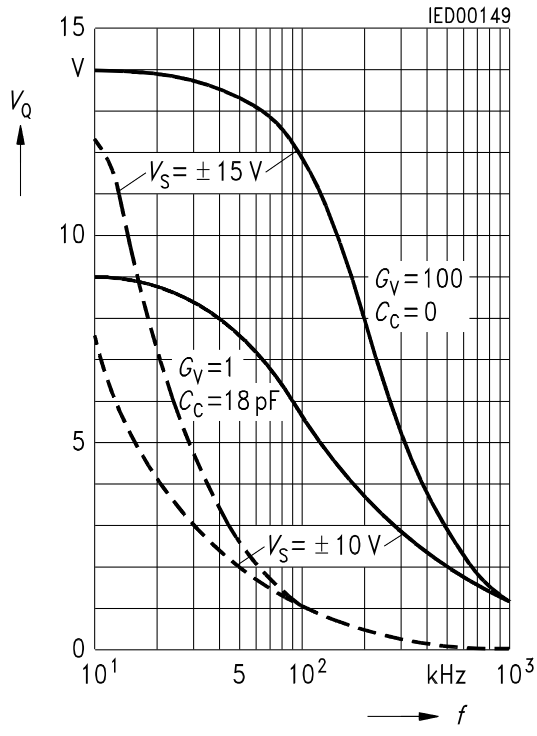
Saturation Voltage versus
Output Current
T_A = 25 °C



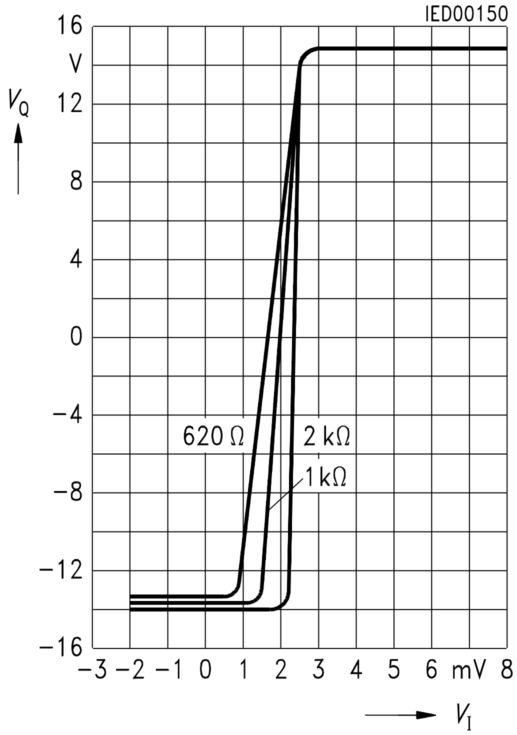
Open-Loop Voltage Gain and
Phase versus Frequency
V_S = ± 15 V; R_L = 2 kΩ



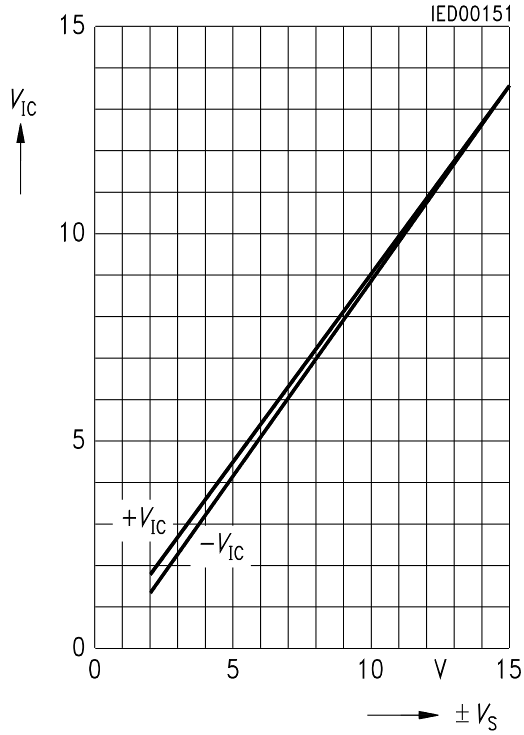
Frequency Dependence of Large
Signal Modulation Output Voltage
versus Frequency



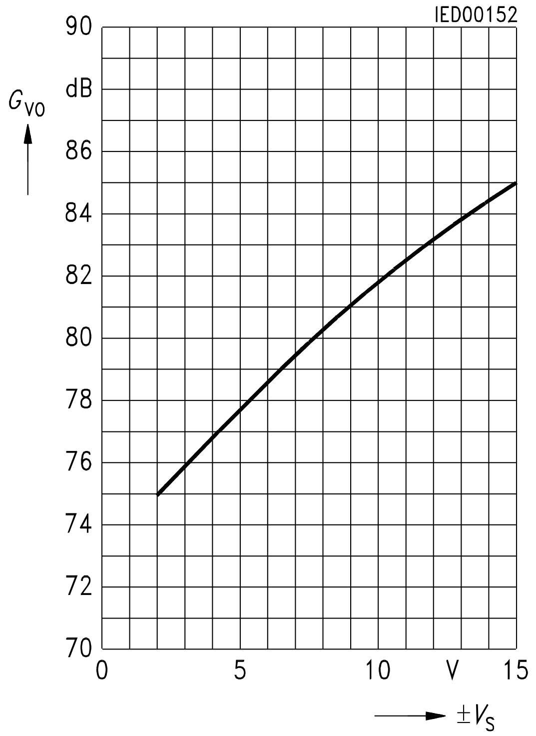
Transfer Characteristic
Output Voltage versus Input Voltage
V_S = ± 15 V; R_L = parameter



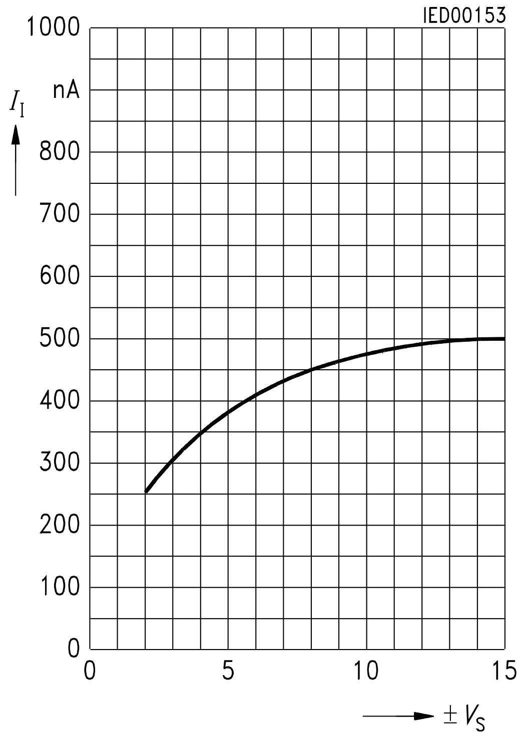
Common-Mode Voltage Range
Common-Mode Input
Voltage versus Supply Voltage



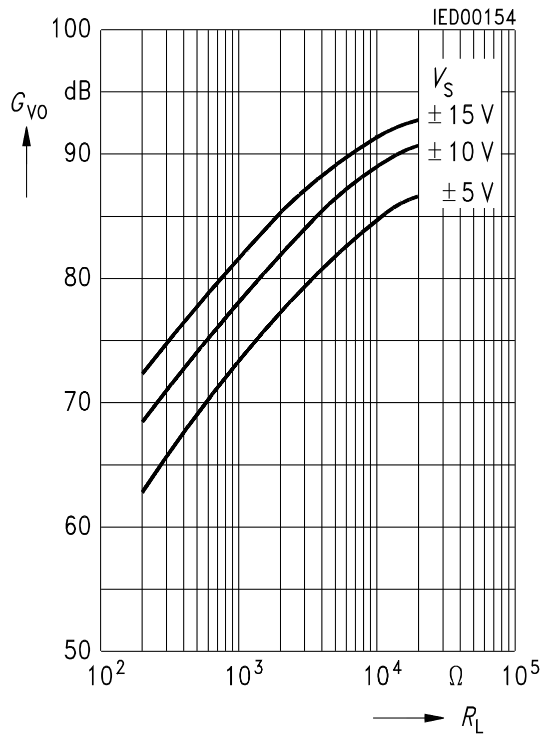
Open-Loop Voltage Gain versus Supply Voltage
T_A = 25 °C, R_L = 2 kΩ



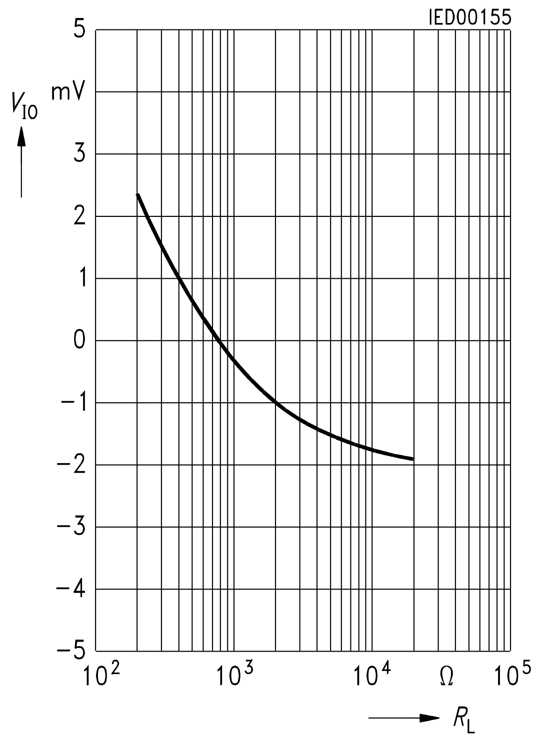
Input Current versus Supply Voltage



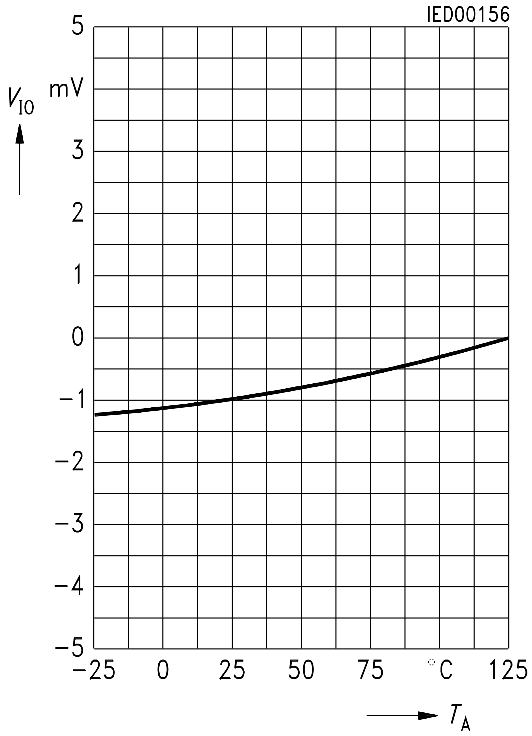
Open-Loop Voltage Gain versus Load Resistance
T_A = 25 °C



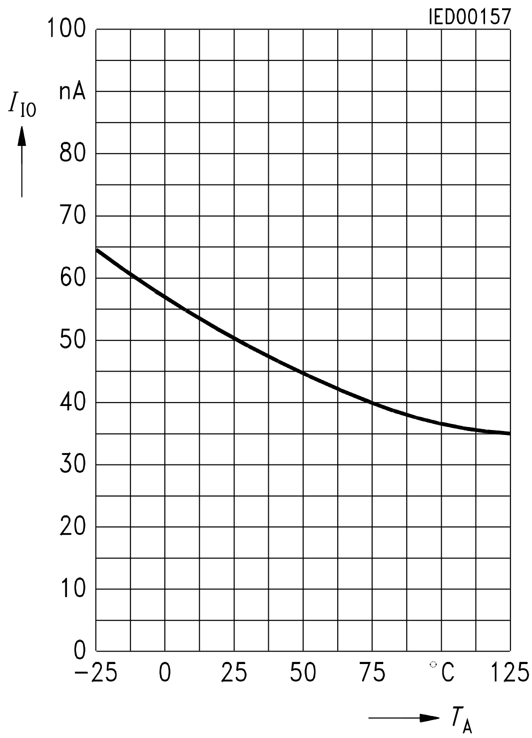
Input Offset Voltage versus Load Resistance
V_S = ± 15 V



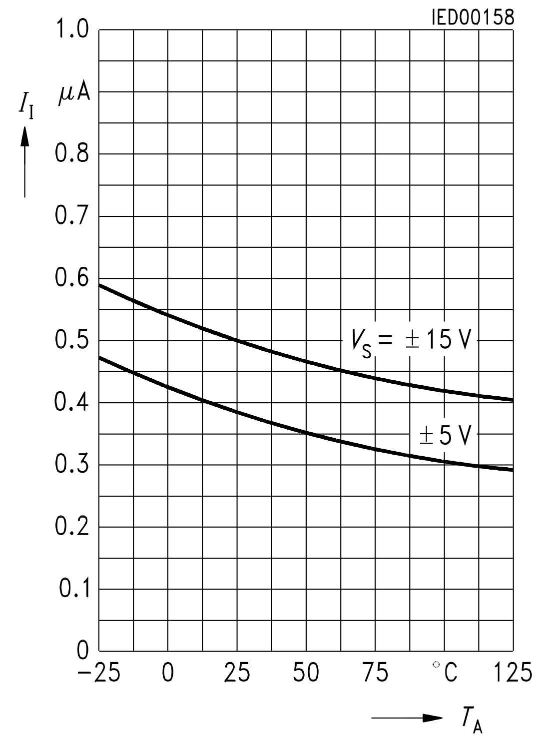
Input Offset Voltage versus Ambient Temperature
$R_L = 2\ k\Omega$; $V_S = \pm 15\ V$



Input Offset Current versus Ambient Temperature
$R_L = 2\ k\Omega$; $V_S = \pm 15\ V$



Input Current versus Ambient Temperature
$R_L = 2\ k\Omega$



Open-Loop Voltage Gain versus Ambient Temperature
$R_L = 2\ k\Omega$; $f = 1\ kHz$